Battelle Memorial Institute

505 KING AVENUE COLUMBUS 1, OHIO

May 14, 1959

Mr. Frank Resnik, Supervisor
Instruments and Physics
Research and Development
Philip Morris, Incorporated
P. O. Box 3D
Richmond 6, Virginia

Dear Frank:

Enclosed are ten copies of our Third Phase Report on "An Investigation of the Dynamic Behavior of Cigarette Smoke". This report is concerned entirely with the "Review of Literature on Retention of Aerosol Particles in the Respiratory Tract", conducted during January, February, and March, in preparation for the experimental study now under way of lung retention of smoke particles.

The First Phase Report, as you will recall, described the cascade impactor developed especially for determining particle-size distribution of cigarette smoke. The Second Phase Report described refinements in the design of the impactor and summarized extensive studies of particle-size distribution as a function of puff sequence, bulk density, brand of cigarette, casing agent, and extent of coagulation.

The enclosed review of the literature on lung retention of aerosol particles covers the mechanisms of particle deposition, methods of producing experimental aerosols, and theoretical and experimental studies of deposition in the respiratory tracts of both humans and animals. Of special interest is the first figure which shows, schematically, the anatomy of the pulmonary tree and the sizes of particles that deposit in each region.

This survey will be helpful to us as we continue our studies of lung retention of cigarette smoke. We hope that it will also serve your research staff by providing, in convenient form, a further understanding of this important subject.

Sincerely yours,

J. M. Pilcher

J. Mason Pilcher
Assistant Division Chief

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